



Test Report

**Compliance with Industry Canada Interference-Causing
Equipment Standard ICES-003**

Product Name : Professional Stereo Digital Wireless Audio Dongles (Receiver)
Model No. : JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1

Applicant : TATUNG CO.

Address : 22, Chungshan N. Rd., 3rd Sec. Taipei,
Taiwan, 104, R.O.C.

Date of Receipt : 2009/06/24

Issued Date : 2009/06/29

Report No. : 096375R-ITUSP02V02

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, NVLAP, NIST or any agency of the Government.

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Test Report Certification

Issued Date : 2009/06/29

Report No. : 096375R-ITUSP02V02



Product Name : Professional Stereo Digital Wireless Audio Dongles (Receiver)

Applicant : TATUNG CO.

Address : 22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Manufacturer : TATUNG CO.

Model No. : JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1

Rated Voltage : AC 120 V / 60 Hz

EUT Voltage : PC USB Port

Trade Name : JANGUS, TATUNG

Applicable Standard : FCC CFR Title 47 Part 15 Subpart B: 2008 Class B
CISPR 22: 2005, ANSI C63.4: 2003
ICES-003 Issue 4: 2004 Class B

Test Result : Complied

Performed Location : Quietek Corporation (Linkou Laboratory)
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Laboratory Information

We , **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scopes:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC, NVLAP
Japan	:	VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://tw.quietek.com/modules/enterprise/services.php?item=100>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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1. General Information

1.1. EUT Description

Product Name	Professional Stereo Digital Wireless Audio Dongles (Receiver)
Trade Name	JANGUS, TATUNG
Model No.	JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1

Component	
Power and signal Cable	Shielded, 0.2m

Note:

1. The different of the four Model is shown as below:

Model No	Trade Name	Color	Description
JM-WAL35-R1	JANGUS	Black	With Microphone function
KEN4-R1	TATUNG	Black	With Microphone function
JM-WAL45-R1	JANGUS	Blue	Without Microphone function
KEN5-R1	TATUNG	Blue	Without Microphone function

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

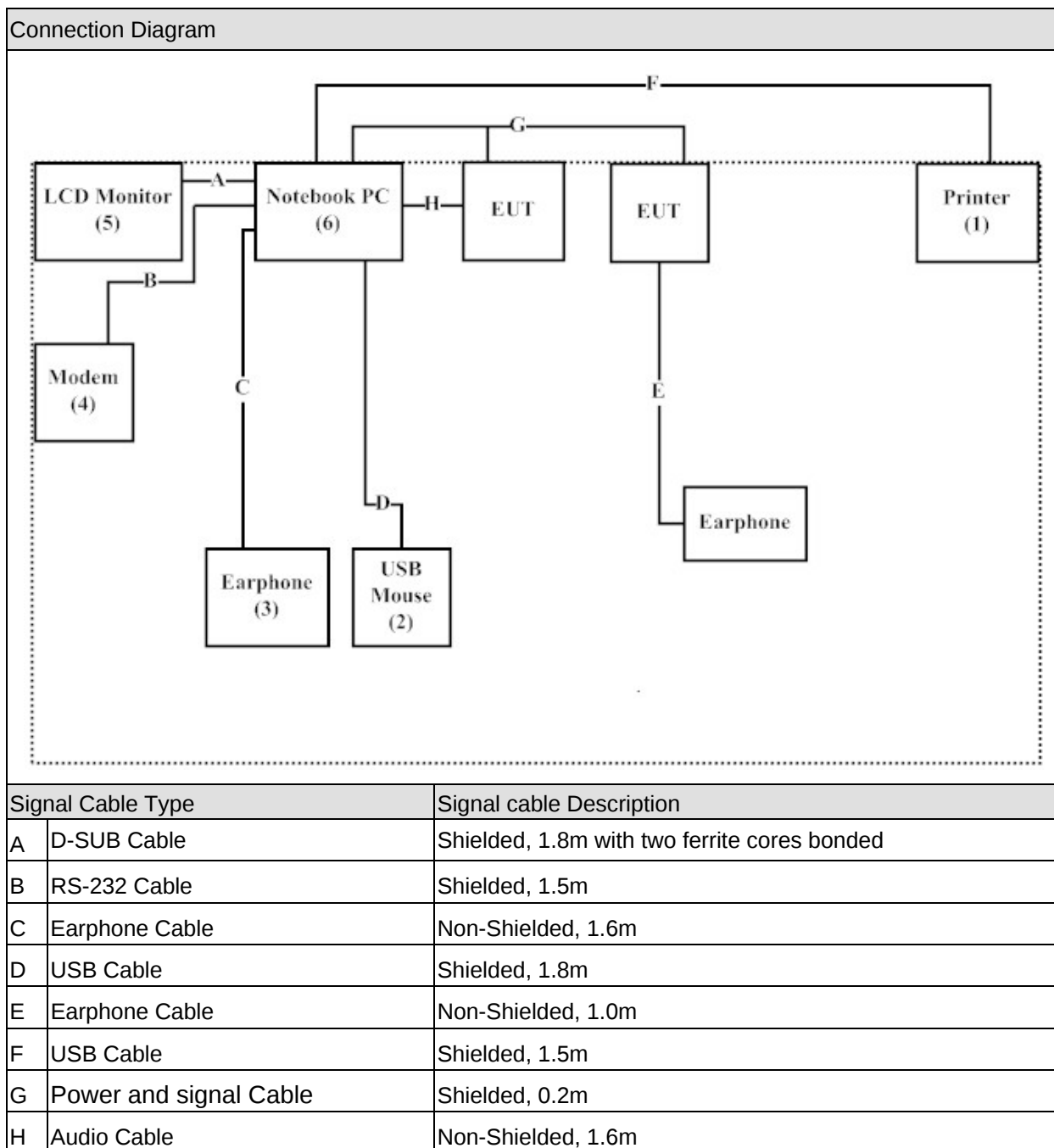
Pre-Test Mode	
Mode 1: Normal Operation	
Final Test Mode	
Emission	Mode 1: Normal Operation

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Printer	EPSON	StyLus C63	FAPY094255	Non-Shielded, 1.9m
2	USB Mouse	Logitech	M-BE58	HCA30103100	N/A
3	Earphone	Dr.AV	CD-806B	N/A	N/A
4	Modem	ACEEX	DM-1414	0102027554	Non-Shielded, 1.8m
5	LCD Monitor	CMV	CT-730D	FNC122F57CA1072	Non-Shielded, 1.8m
6	Notebook PC	DELL	PP04X	C8YYM1S	Non-Shielded, 0.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	A mufti meter was used to verify the model operation before the measurement.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart B: 2008 Class B ANSI C63.4: 2003	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B: 2008 Class B ANSI C63.4: 2003	Yes	No

2.2. List of Test Equipment

Conducted Emission / SR1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCS 30	100366	2008/10/18
LISN	R&S	ENV4200	833209/007	2008/08/12
LISN	R&S	ENV216	100085	2009/02/14
Pulse Limiter	R&S	ESH3-Z2	357.88.10.52	2008/09/04

Radiated Emission / Site2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2921	2008/09/15
Broadband Horn Antenna	Schwarzbeck	BBHA9170	208	2008/07/25
EMI Test Receiver	R&S	ESCS 30	100123	2009/03/23
Horn Antenna	Schwarzbeck	BBHA9120D	305	2008/08/10
Pre-Amplifier	QTK	N/A	N/A	2009/01/03
Spectrum Analyzer	Advantest	R3162	120300652	2009/04/06

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.26 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.19 dB.

2.4. Test Environment

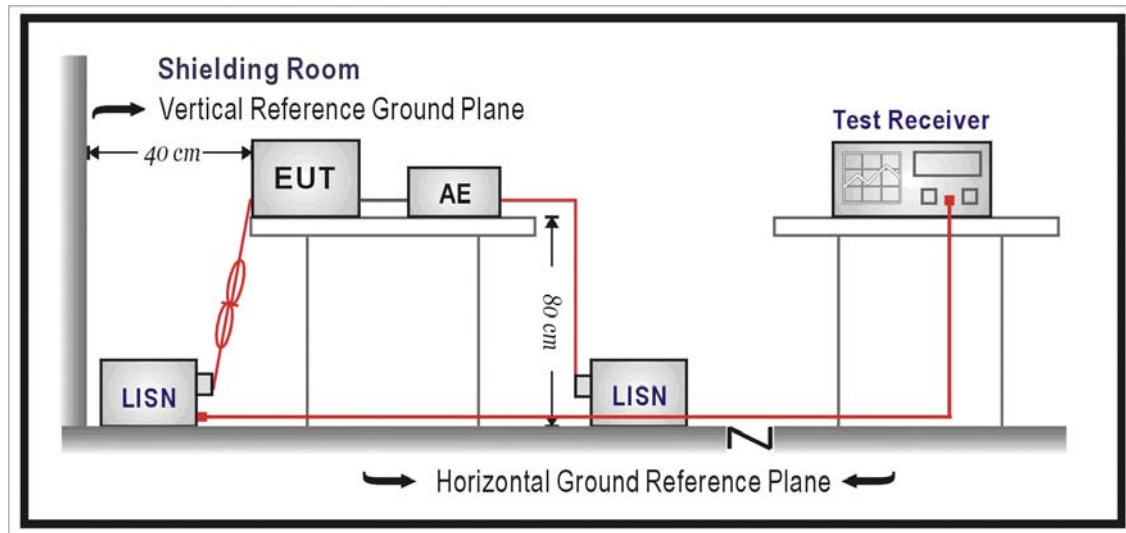
Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Radiated Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

3.1. Test Specification

According to Standard : FCC Part 15 Subpart B, ANSI C63.4

3.2. Test Setup



3.3. Limit

Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

3.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

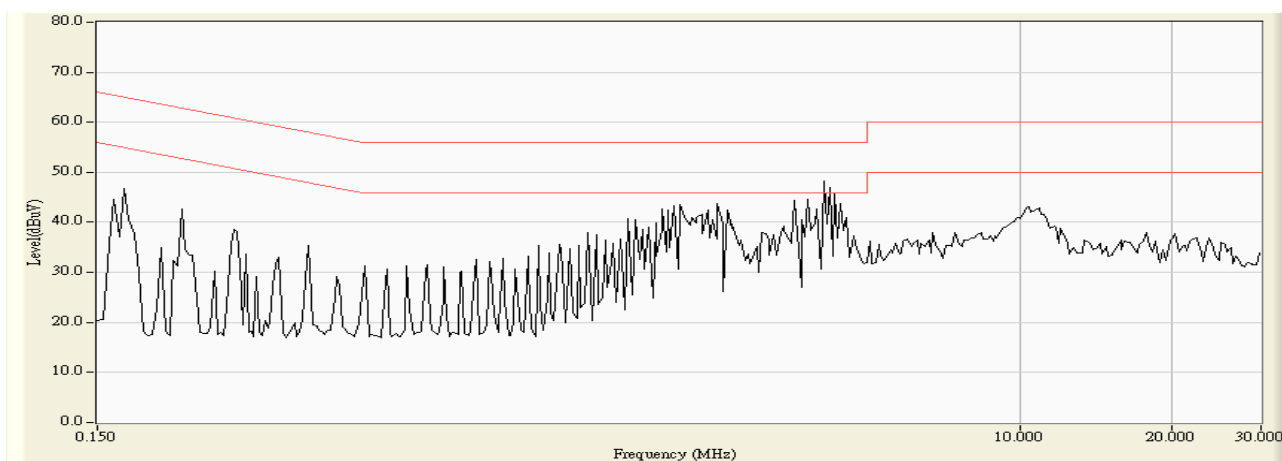
(Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.

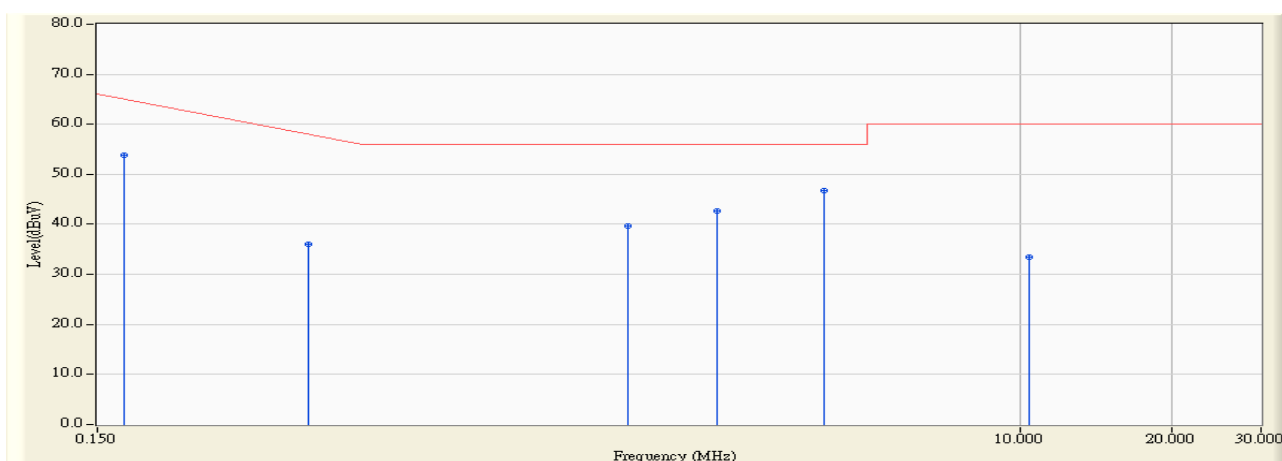
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Test Result

Site : SR1	Time : 2009/06/24 - 17:51
Limit : CISPR_B_00M_QP	Margin : 10
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-L1 - Line1
Power : AC 120V/60Hz	Note : Mode 1



Site : SR1	Time : 2009/06/24 - 17:52
Limit : CISPR_B_00M_QP	Margin : 0
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-L1 - Line1
Power : AC 120V/60Hz	Note : Mode 1

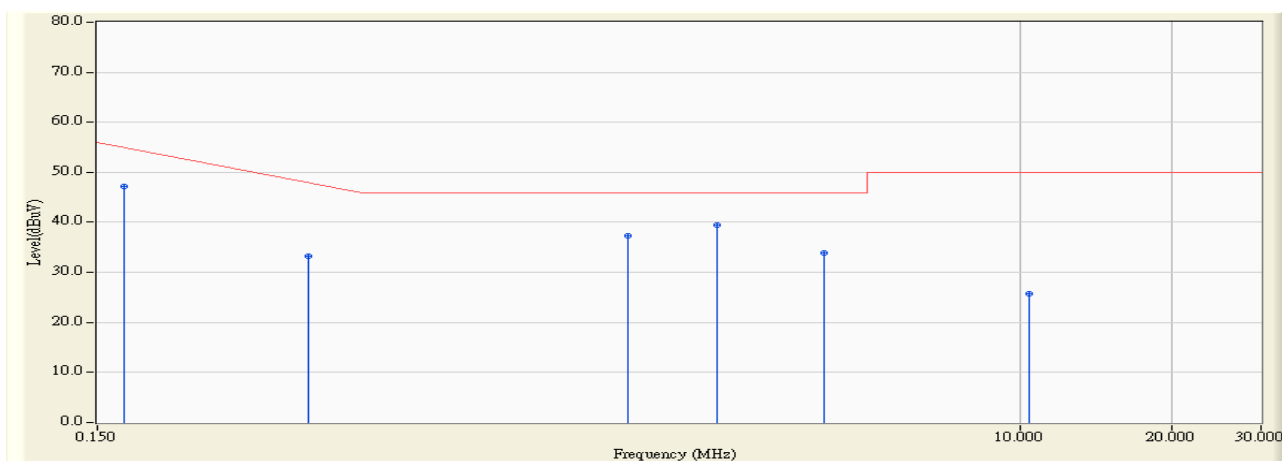


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.170	9.814	43.930	53.744	-11.685	65.429	QUASIPeAK
2		0.392	9.820	26.130	35.950	-23.136	59.086	QUASIPeAK
3		1.681	9.840	29.940	39.780	-16.220	56.000	QUASIPeAK
4		2.521	9.850	32.830	42.680	-13.320	56.000	QUASIPeAK
5	*	4.091	9.860	36.950	46.810	-9.190	56.000	QUASIPeAK
6		10.427	9.920	23.540	33.460	-26.540	60.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	Time : 2009/06/24 - 17:52
Limit : CISPR_B_00M_AV	Margin : 0
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-L1 - Line1
Power : AC 120V/60Hz	Note : Mode 1

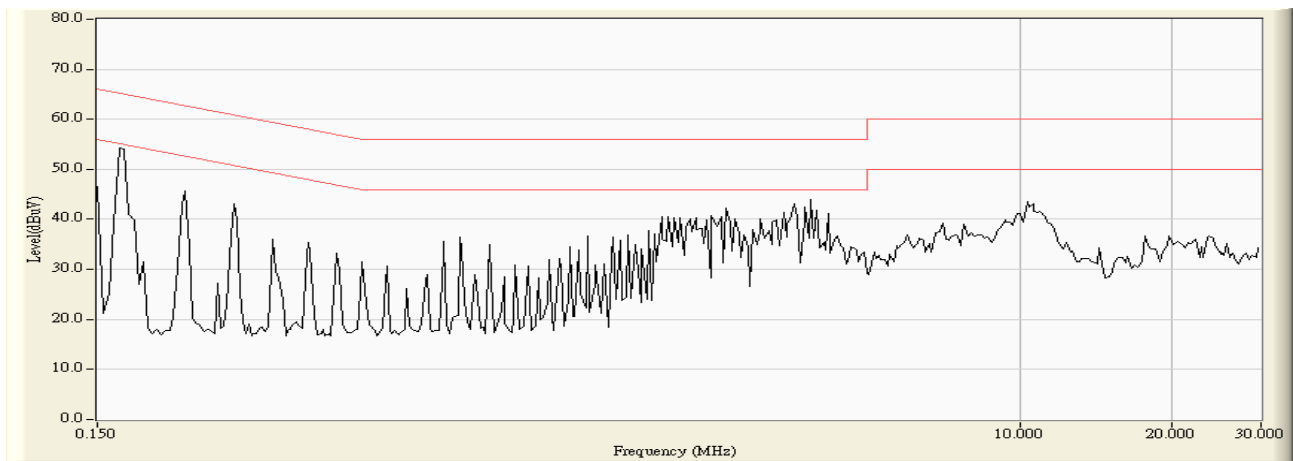


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.170	9.814	37.430	47.244	-8.185	55.429	AVERAGE
2		0.392	9.820	23.470	33.290	-15.796	49.086	AVERAGE
3		1.681	9.840	27.430	37.270	-8.730	46.000	AVERAGE
4	*	2.521	9.850	29.570	39.420	-6.580	46.000	AVERAGE
5		4.091	9.860	24.060	33.920	-12.080	46.000	AVERAGE
6		10.427	9.920	15.920	25.840	-24.160	50.000	AVERAGE

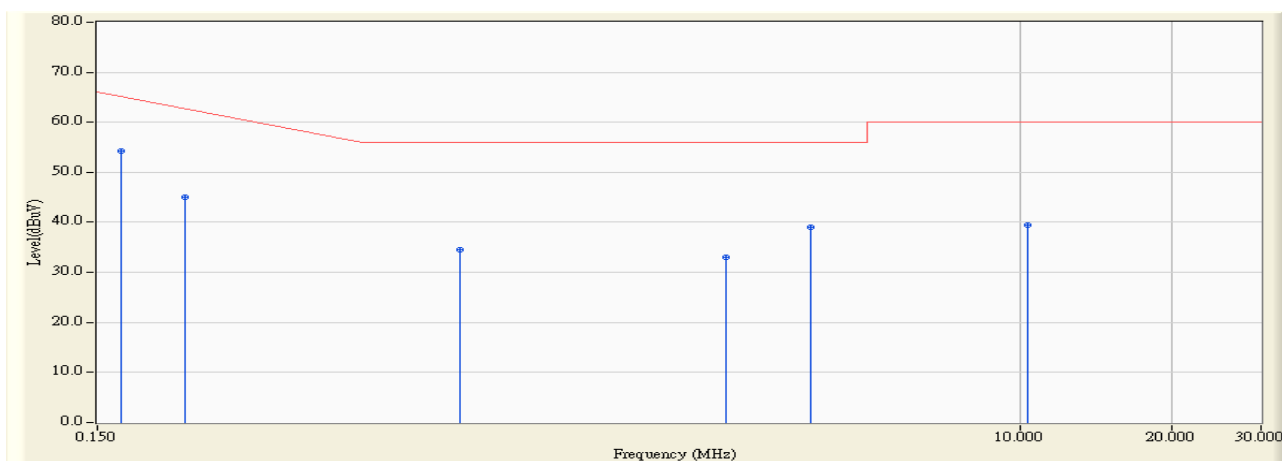
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	Time : 2009/06/24 - 17:53
Limit : CISPR_B_00M_QP	Margin : 10
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-N - Line2
Power : AC 120V/60Hz	Note : Mode 1



Site : SR1	Time : 2009/06/24 - 17:54
Limit : CISPR_B_00M_QP	Margin : 0
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-N - Line2
Power : AC 120V/60Hz	Note : Mode 1

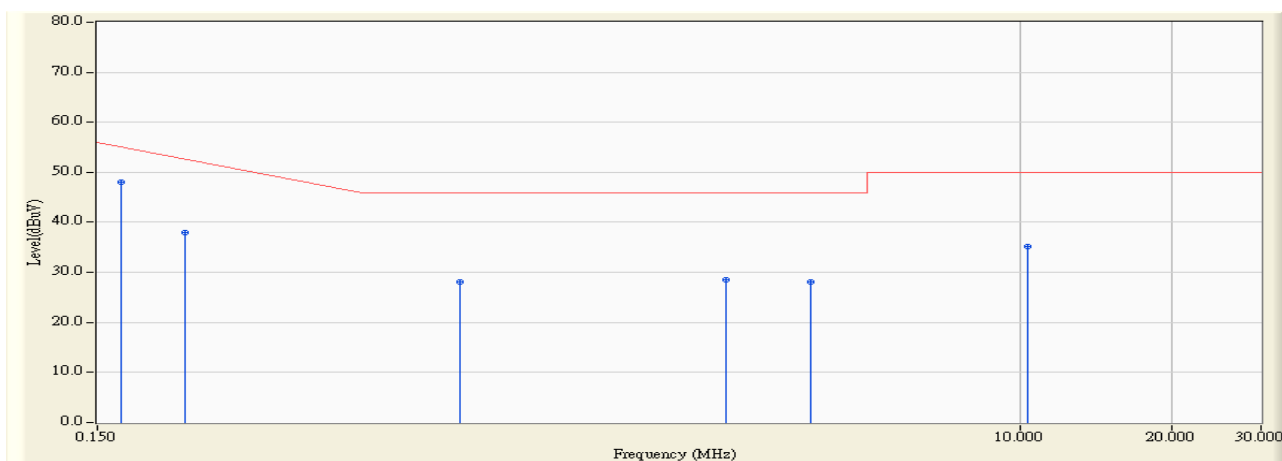


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.167	9.867	44.330	54.197	-11.317	65.514	QUASIPeAK
2		0.224	9.860	35.240	45.100	-18.786	63.886	QUASIPeAK
3		0.783	9.830	24.790	34.620	-21.380	56.000	QUASIPeAK
4		2.630	9.850	23.260	33.110	-22.890	56.000	QUASIPeAK
5		3.861	9.860	29.140	39.000	-17.000	56.000	QUASIPeAK
6		10.353	9.930	29.430	39.360	-20.640	60.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : SR1	Time : 2009/06/24 - 17:54
Limit : CISPR_B_00M_AV	Margin : 0
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : ENV-216-N - Line2
Power : AC 120V/60Hz	Note : Mode 1



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.167	9.867	38.260	48.127	-7.387	55.514	AVERAGE
2		0.224	9.860	28.170	38.030	-15.856	53.886	AVERAGE
3		0.783	9.830	18.240	28.070	-17.930	46.000	AVERAGE
4		2.630	9.850	18.730	28.580	-17.420	46.000	AVERAGE
5		3.861	9.860	18.210	28.070	-17.930	46.000	AVERAGE
6		10.353	9.930	25.210	35.140	-14.860	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3.6. Test Photograph

Test Mode : Mode 1: Normal Operation

Description : Front View of Conducted Test



Test Mode : Mode 1: Normal Operation

Description : Back View of Conducted Test



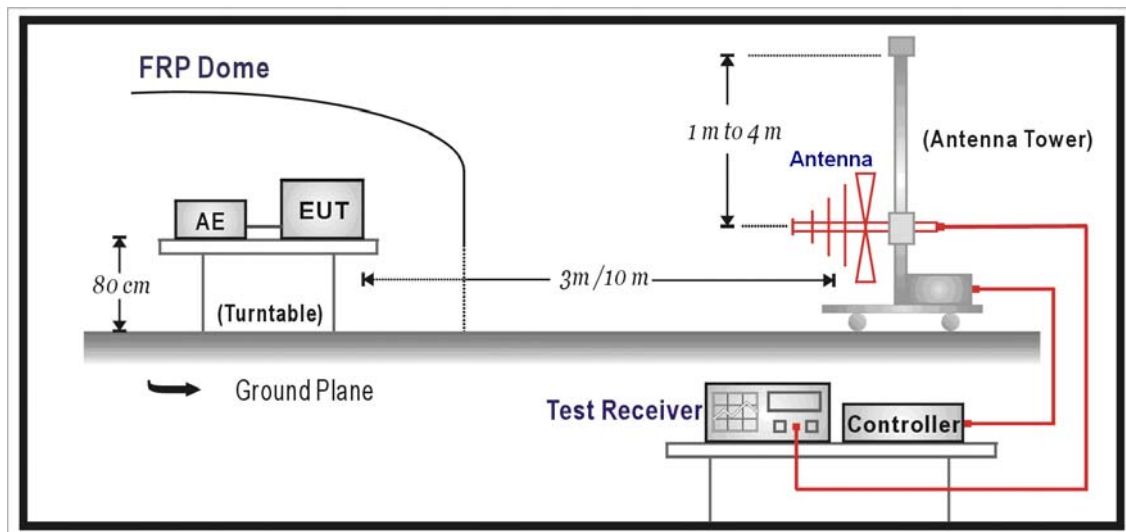
4. Radiated Emission

4.1. Test Specification

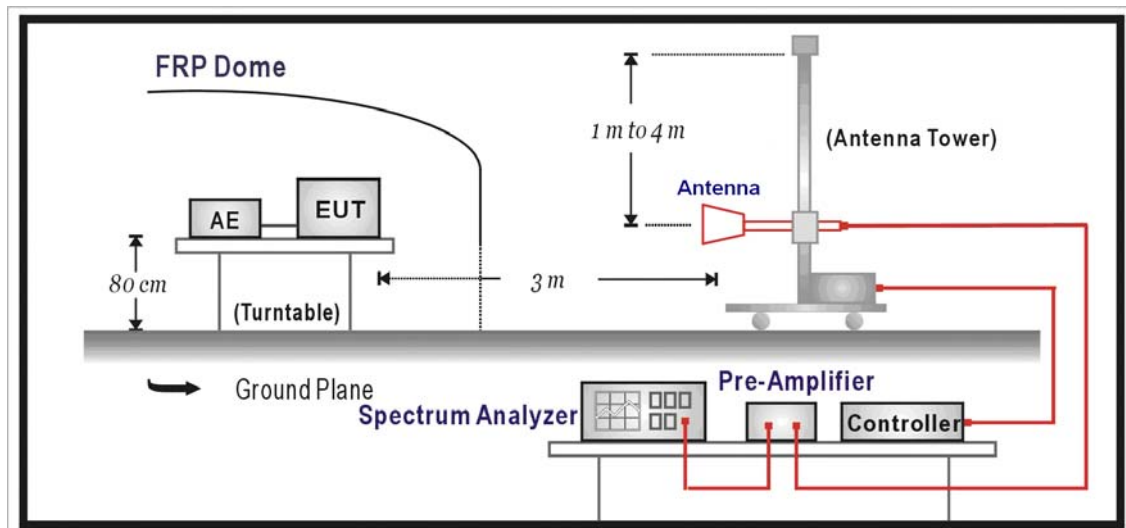
According to EMC Standard : FCC Part 15 Subpart B, ANSI C63.4

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Under 1GHz test shall not exceed the following value:

Limits		
Frequency (MHz)	Distance (m)	dBuV/m
30 – 230	10	30
230 – 1000	10	37

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30-88	3	40
88-216	3	43.5
216-960	3	46
Above 960	3	54

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

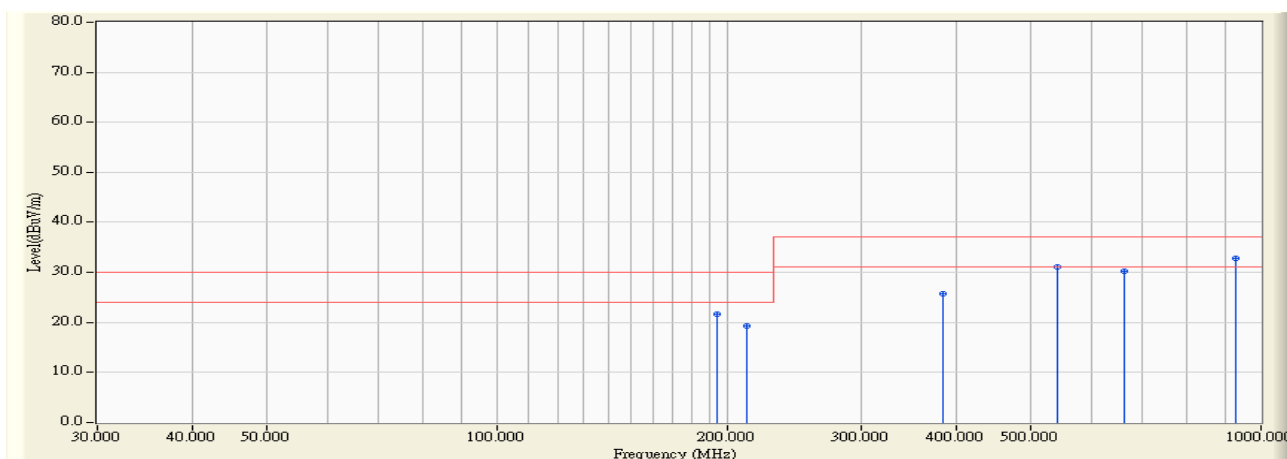
For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

4.5. Test Result

Site : OATS-2	Time : 2009/06/23 - 10:35
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : Site2_CBL6112_10M_0811 - HORIZONTAL
Power : AC 120V / 60Hz	Note : Mode 1

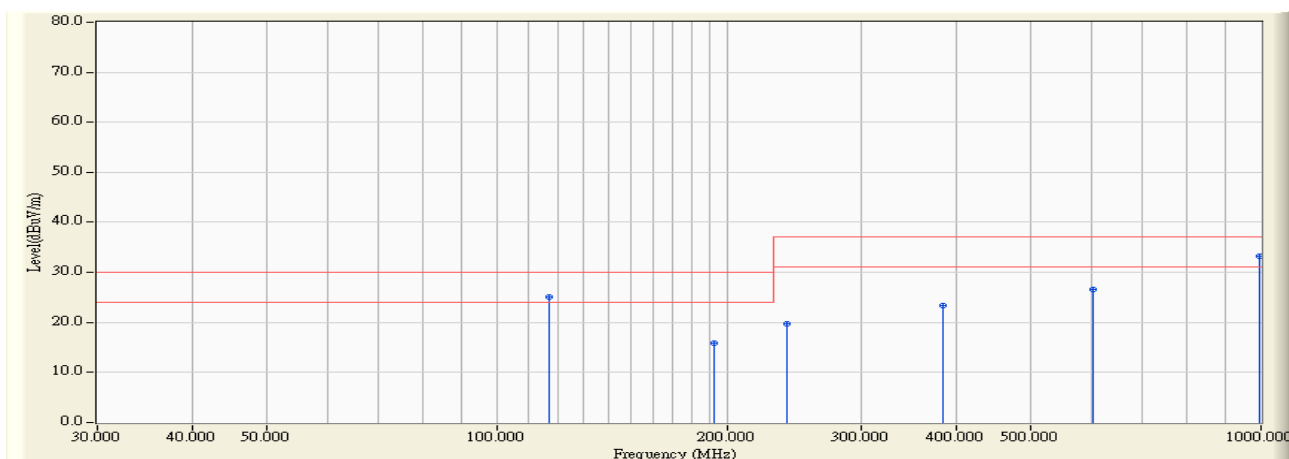


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		193.850	12.179	9.460	21.639	-8.361	30.000	QUASIPeAK	365.185	32.448
2		212.700	13.175	6.170	19.345	-10.655	30.000	QUASIPeAK	235.986	128.484
3		383.990	19.448	6.280	25.728	-11.272	37.000	QUASIPeAK	106.423	124.949
4		540.660	22.550	8.650	31.199	-5.801	37.000	QUASIPeAK	236.000	-68.000
5		662.510	24.141	6.200	30.341	-6.659	37.000	QUASIPeAK	146.000	-98.000
6	*	927.510	27.775	5.000	32.775	-4.225	37.000	QUASIPeAK	141.000	146.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS-2	Time : 2009/06/23 - 10:24
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : Site2_CBL6112_10M_0811 - VERTICAL
Power : AC 120V / 60Hz	Note : Mode 1

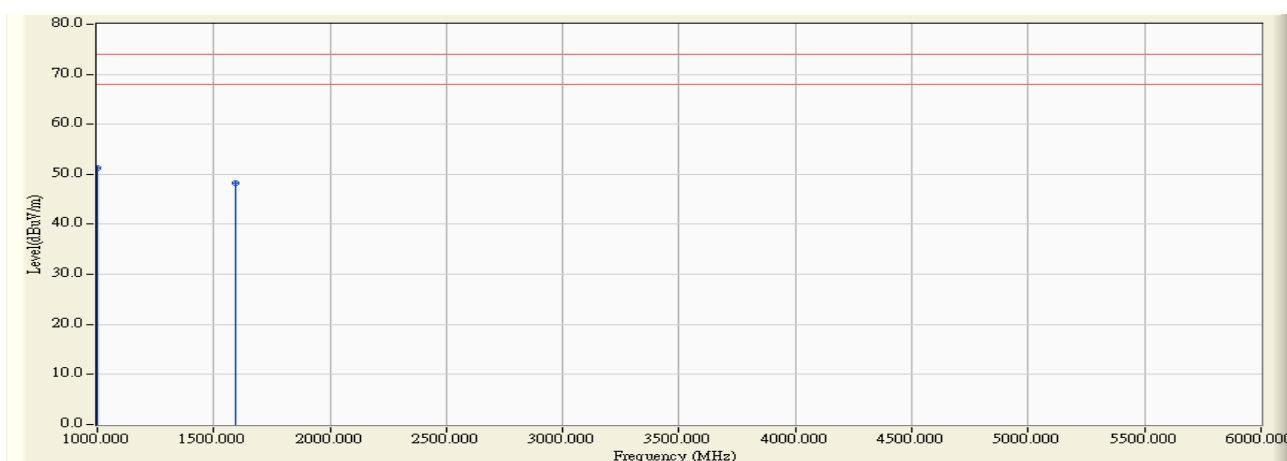


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		117.300	14.790	10.390	25.180	-4.820	30.000	QUASIPeAK	100.000	25.000
2		192.170	12.170	3.600	15.770	-14.230	30.000	QUASIPeAK	100.000	-145.000
3		240.000	15.210	4.530	19.740	-17.260	37.000	QUASIPeAK	100.000	98.000
4		384.000	19.448	4.000	23.448	-13.552	37.000	QUASIPeAK	120.000	-75.000
5		604.200	23.520	3.000	26.520	-10.480	37.000	QUASIPeAK	258.000	-98.000
6	*	997.120	29.001	4.190	33.191	-3.809	37.000	QUASIPeAK	175.000	21.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS-2	Time : 2009/06/24 - 19:31
Limit : FCC_B_(Above_1G)_03M_PK	Margin : 6
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : 9120D_1-18G_Horn - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1

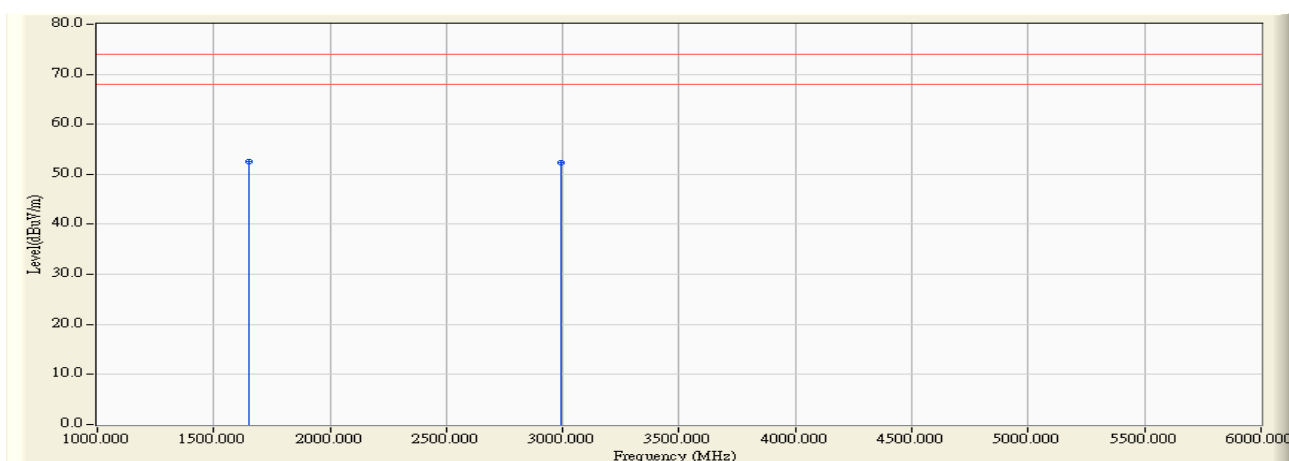


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	1000.000	-6.600	57.940	51.340	-22.660	74.000	PEAK
2		1591.000	-5.012	53.360	48.348	-25.652	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OATS-2	Time : 2009/06/24 - 19:33
Limit : FCC_B_(Above_1G)_03M_PK	Margin : 6
EUT : Professional Stereo Digital Wireless Audio Dongles (Receiver)	Probe : 9120D_1-18G_Horn - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	1651.300	-4.889	57.470	52.581	-21.419	74.000	PEAK
2		2993.000	-0.043	52.290	52.247	-21.753	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4.6. Test Photograph

Test Mode : Mode 1: Normal Operation

Description : Front View of Radiated Test



Test Mode : Mode 1: Normal Operation

Description : Back View of Radiated Test



Test Mode : Mode 1: Normal Operation

Description : Front View of High Frequency Radiated Test

